

HOVENIA DULCIS (RHAMNACEAE) NATURALIZED
IN CENTRAL TEXAS

In the late summer of 1997 an unusual tree about 12 m tall was observed at the base of a high limestone cliff above Town Lake on the Colorado River in Austin. It had alternate leaves with prominent veins, and appeared to have strange fruiting structures high on the branches, these structures apparently deformed with galls. The tree was identified as a member of the Rhamnaceae based on the characteristic three-carpellate fruit with a remnant disk at the base, very similar to *Colubrina*. Comparison with the Rhamnaceae collection at TEX revealed the tree to be *Hovenia dulcis* Thunberg (Fig. 1), the Chinese raisin tree, which is known to be cultivated in Texas (Jones et al. 1997). Mabberley (1997) suggested *Hovenia* to be of close affinity to *Colubrina*, while recent work by Richardson (unpublished data) suggest that it is more closely-allied with *Ziziphus*. What appeared to be galls are actually peduncles that swell naturally as the fruit develops.

This species is native to mesic forests in China and was introduced into India and Japan for its edible peduncles (Hooker 1872; Rehder 1940; Roxburgh 1975; Sargent 1916). In China the swollen peduncles of the cymose inflorescences have long been used medicinally "to offset the effects of over-indulgence in wine" (Sargent 1916). The peduncles are especially palatable after frost when they redden and the juice sweetens with pear-like flavor (Mabberley 1990; Reich 1991). The fruit itself is not edible.

This tree is known for its cold-hardiness and is cultivated in USDA climate zone 5, with minimum temperatures of -20°F (Dirr 1990; Staff of the L.H. Bailey Hortorium 1976), the equivalent of Milwaukee, WI or Binghamton, NY. It is therefore surprising to find it naturalized in Austin, TX, an area that is much warmer, and more importantly, significantly drier than much of zone 5. The locality where it grows in Austin is a cool, moist microclimate, at the base of a cliff of Edwards limestone and dolomite perhaps 40 m high, facing directly to the northeast. This cliff reaches almost to lake level, except for a very short but steep talus slope of boulders and loamy soil. Vegetation growing at the base of this northeast-facing cliff is almost completely protected from mid-day and afternoon sun, and the presence of a body of water surely modifies the microclimate further. Further exploration via boat several weeks later resulted in the discovery of a larger tree perhaps 100 m upstream, and a smaller tree perhaps 100 m downstream, both at the base of the same cliff. Flowering specimens were later collected in May 1998 from the first tree discovered.

It is possible that this small population of *H. dulcis* is descended from cultivated specimens that existed at the University of Texas College of Pharmacy



FIG. 1. Fruiting branch of *Hovenia dulcis* Thunb., showing capsules and swollen peduncles. Bar = 1 cm.

Drug Garden, the only other specimens known from the Austin area. Prior to the mid-1940s this garden existed about four miles to the north-east of the collection site, and was subsequently abandoned and never reconstructed (Beryl Simpson, pers. comm.). Two specimens exist at TEX from this garden, dated 1940 and 1946. It is possible that while *H. dulcis* was cultivated in this garden, birds ate the fruit, roosted on the cliffs and trees by the river, and defecated the seed to the forest soil far below. Until the early 1960's this portion of the Colorado river was still free-flowing, and large stretches of loamier soil, which is preferred by *H. dulcis* (Dirr 1990; Staff of the L.H. Bailey Hortorium 1976), likely existed. When Town Lake was created in the early 1960's, perhaps a much larger population of this species was submerged and destroyed, leaving only a small number of individuals growing near the top of the appropriate habitat. During further explorations, no seedlings were observed, and seedling success is probably quite low because numerous other species compete for space on this very thin ribbon of land. Furthermore, the majority of fruiting branches overhang the water, so most

fruit falls directly to the bottom of the lake. Similar habitats exist within the region, so it is possible that *H. dulcis* occurs unobserved elsewhere.

Voucher specimens: TEXAS. Travis Co.: tree 40 ft tall, growing at the base of a high, NE-facing limestone cliff along the edge of Town Lake, with *Cornus drummondii*, *Platanus occidentalis*, and *Smilax bona-nox*, across the lake from the boat ramp at the University of Texas Brackenridge Field Lab, Austin, 30 Sep 1997, *D. Goldman with J. Crutchfield* 1105 (BH, BRIT, TEX); same locality but with flowers, 29 May 1998, *D. Goldman with P. Griffith* 1200 (BH, BRIT, TEX).

Other specimens examined: TEXAS. Travis Co.: cultivated, Austin, 16 Sep 1940, *C.C. Albers s.n.* (TEX); ex cultivation; Drug Garden, University of Texas, 24 May 1946, *C.C. Albers 46pb060* (TEX).

Thanks is given to John Crutchfield and Patrick Griffith for their assistance in obtaining specimens of this plant, and Hobbes Goldman, Beryl Simpson, Billie Turner, Justin Williams, and Tom Wendt for their assistance with the manuscript.—*Douglas H. Goldman, Department of Botany, University of Texas, Austin, TX 78713-7640, U.S.A.*

REFERENCES

- DIRR, M.A. 1990. Manual of woody landscape plants: Their identification, ornamental characteristics, culture, propagation and uses. Fourth edition. Stipes Publishing, Champaign.
- HOOKE, J.D. 1872. The flora of British India, part 1. L. Reeve & Co., London.
- JONES, S.D., J.K. WIPFF, and P.M. MONTGOMERY. 1997. Vascular plants of Texas. A comprehensive checklist. University of Texas Press, Austin.
- MABBERLEY, D.J. 1997. The plant book. Second edition. Cambridge University Press, Cambridge.
- REHDER, A. 1940. Manual of cultivated trees and shrubs. Macmillan Publishing Co., New York.
- REICH, L. 1991. Uncommon fruits worthy of attention. Addison-Wesley, Reading.
- ROXBURGH, W. 1824. Flora Indica. Reprinted by Oriole Editions, 1975, New York.
- SARGENT, C. S. 1916. Plantae Wilsonianae, vol 2. Cambridge University Press, Cambridge.
- STAFF OF THE L.H. BAILEY HORTORIUM. 1976. Hortus third. Macmillan Publishing Co., New York.